

***FlyBy Math™* Alignment**  
**Core Curriculum Content Standards for**  
**Mathematics**

**STANDARD 4.1 NUMBER AND NUMERICAL OPERATIONS**

All students will develop number sense and will perform standard numerical operations and estimations on all types of numbers in a variety of ways.

**Strand 4.1.7 A. Number Sense**

**Cumulative Progress Indicators**

3. Understand and use ratios, proportions, and percents (including percents greater than 100 and less than 1) in a variety of situations.

***FlyBy Math™* Activities**

--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.

--Use calculations and experimental evidence to predict, describe, and explain several aircraft conflict problems.

**STANDARD 4.2 GEOMETRY AND MEASUREMENT**

All students will develop spatial sense and the ability to use geometric properties, relationships, and measurement to model, describe and analyze phenomena.

**Strand 4.2.7 D. Units of Measurement**

**Cumulative Progress Indicators**

2. Select and use appropriate units and tools to measure quantities to the degree of precision needed in a particular problem-solving situation.

***FlyBy Math™* Activities**

--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.

**STANDARD 4.3 PATTERNS AND ALGEBRA**

All students will represent and analyze relationships among variable quantities and solve problems involving patterns, functions, and algebraic concepts and processes.

**Strand 4.3.7 B. Functions & Relationships**

**Cumulative Progress Indicators**

1. Graph functions, and understand and describe their general behavior.

- Equations involving two variables.

***FlyBy Math™* Activities**

--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.

**Strand 4.3.7 C. Modeling**

**Cumulative Progress Indicators**

1. Analyze functional relationships to explain how a change in one quantity can result in a change in another, using pictures, graphs, charts, and equations

***FlyBy Math™* Activities**

--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.

	<p>--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to draw conclusions.</p> <p>--Interpret the slope of a line in the context of a distance-rate-time problem.</p>
<p>2. Use patterns, relations, symbolic algebra, and linear functions to model situations.</p> <ul style="list-style-type: none"> <li>• Using manipulatives, tables, graphs, verbal rules, algebraic expressions/equations/</li> <li>• Growth situations, such as population growth and compound interest, using recursive (e.g., NOW-NEXT) formulas (cf. science standard 5.5 and social studies standard 6.6)</li> </ul>	<p>--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.</p> <p>--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.</p> <p>--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.</p>

## STANDARD 4.5 MATHEMATICAL PROCESSES

All students will use mathematical processes of problem solving, communication, connections, reasoning, representations, and technology to solve problems and communicate mathematical ideas.

### Strand 4.5 A. Problem Solving

Cumulative Progress Indicators	<i>FlyBy Math™</i> Activities
1. Learn mathematics through problem solving, inquiry, and discovery.	<p>--Conduct simulation and measurement for several aircraft conflict problems.</p> <p>--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.</p>
<p>2. Solve problems that arise in mathematics and in other contexts.</p> <ul style="list-style-type: none"> <li>• Open-ended problems</li> <li>• Non-routine problems</li> <li>• Problems with multiple solutions</li> <li>• Problems that can be solved in several ways</li> </ul>	<p>--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios</p> <p>--Use tables, graphs, and equations to solve aircraft conflict problems.</p>
3. Select and apply a variety of appropriate problem-solving strategies (e.g., “try a simpler problem” or “make a diagram”) to solve problems.	--Use tables, graphs, and equations to solve aircraft conflict problems.
5. Monitor their progress and reflect on the process of their problem solving activity.	--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.

### Strand 4.5 B. Communication

Cumulative Progress Indicators	<i>FlyBy Math™</i> Activities
2. Communicate mathematical thinking coherently and clearly to peers, teachers, and others, both orally and in writing.	--Predict outcomes and explain results of mathematical models and experiments.

	--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.
4. Use the language of mathematics to express mathematical ideas precisely.	<p>--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.</p> <p>--Predict outcomes and explain results of mathematical models and experiments.</p>
<b>Strand 4.5 C. Connections</b>	
<b>Cumulative Progress Indicators</b>	<b><i>FlyBy Math™</i> Activities</b>
3. Recognize that mathematics is used in a variety of contexts outside of mathematics.	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.
4. Apply mathematics in practical situations and in other disciplines.	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.
<b>Strand 4.5 E. Representations</b>	
<b>Cumulative Progress Indicators</b>	<b><i>FlyBy Math™</i> Activities</b>
1. Create and use representations to organize, record, and communicate mathematical ideas. <ul style="list-style-type: none"> <li>• Pictorial representations (e.g., diagrams, charts, or tables)</li> <li>• Symbolic representations (e.g., a formula)</li> <li>• Graphical representations (e.g., a line graph)</li> </ul>	--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.
2. Select, apply, and translate among mathematical representations to solve problems.	--Choose among tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
3. Use representations to model and interpret physical, social, and mathematical phenomena.	--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.